Microwave synthesis of $YFeO_3$

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Microwave radiation acting directly on the reaction mixture leads to higher rate of the chemical reaction as compared with the thermal heating. Sodium hydroxide NaOH (20 %, analytical grade, Russian State Standard GOST 432877), yttrium nitrate $Y(NO_3)_3 \cdot 6H_2O$ (analytical grade, CAS 13494-98) and iron nitrate (III) $Fe(NO_3)_3 \cdot 9H_2O$ (pure, TU 6-09-02-553-96) were used as precursors for the synthesis of $YFeO_3$.

The reaction of yttrium ferrite precipitating was carried out under microwave irradiation on the precursors solution at 700 W during 26 min. After cooling to room temperature, yttrium ferrite precipitate was separated from the solution by filtration, air dried and annealed in a muffle oven for two hours at 800 °C. According to the XRD the sample is almost pure $YFeO_3$ with minor inclusions of Y_2O_3 and Fe_2O_3. The average particle size is about 40 nm.

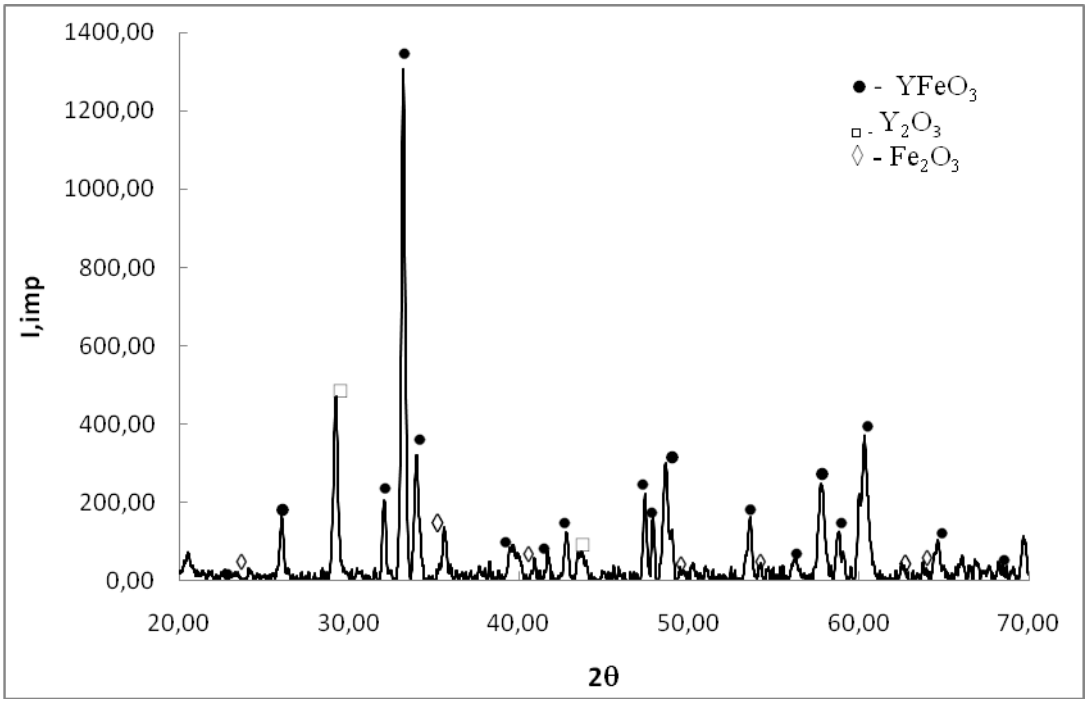

Fig. The diffractogram of $YFeO_3$, synthesized under microwave irradiation.

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